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6015555, C9810-3390C-016; 980902.

Title

Trajectory measurement system for wheeled robot using CCD camera.

Author(s)[Emura-T](#); [Senta-Y](#); [Hiyama-M](#); [Kaneko-T](#); [Arakawa-A](#).**Author affiliation**

Fac of Eng, Tohoku Univ, Sendai, Japan.

SourceTransactions-of-the-Society-of-Instrument-and-Control-Engineers
(Japan), vol.34, no.6, p.498-503, June 1998. , Published: Soc. Instrum. & Control Eng.**CODEN**

TSICA9.

ISSN

ISSN: 0453-4654.

Availability

SICI: 0453-4654(199806)34:6L:498:TMSW; 1-2.

Publication year

1998.

Language

JA.

Publication type

J Journal Paper.

Treatment codes

T Theoretical or Mathematical; X Experimental.

Abstract

In order to analyze the mechanism of dead reckoning of wheeled robot, it is necessary to measure the trajectory of robot. The authors developed a measurement system using a CCD camera with electrically powered lens that tracks automatically a small wheeled robot using two servomotors. These servomotors have made possible to measure on large area and with high accuracy using zoom lens. After measuring and simulating the accuracy of this system, it was concluded that the main cause of measurement error is due to cross-coupling errors of the tracking system. In order to calibrate the measurement error, the authors used the table look-up method, and satisfactory results were obtained. This paper describes methods for reducing the measurement errors and the experimental

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6964335, B2001-08-7520-010; 20010625.

TitleMagneto-optic hybrid 3-D **sensor** for surgical navigation.**Author(s)**Nakamoto-M; Sato-Y; Tamaki-Y; Nagano-H; Miyamoto-M; Sasama-T; Monden-M; Tamura-S; Ed. by Delp-S-L; DiGioia-A-M; Jaramaz-B.**Author affiliation**

Graduate Sch of Eng Sci, Osaka Univ, Japan.

SourceMedical Image Computing and Computer-Assisted Intervention - MICCAI 2000. Third International Conference. Proceedings, Pittsburgh, PA, USA, 11-14 Oct. 2000.
In: p.839-48, 2000.**ISSN**

ISBN: 3-540-41189-5.

Publication year

2000.

Language

EN.

Publication type

CPP Conference Paper.

Treatment codes

P Practical; X Experimental.

Abstract

We have developed an accurate **3D** sensory system without a line-of-sight requirement for surgical navigation inside the body. Although magnetic sensors seem to be particularly suitable for this purpose, their accuracy is affected by metallic objects, which can hardly be avoided in a surgical environment. We propose a new magneto-optic hybrid **3D sensor** configuration that overcomes this limitation. Unlike previous hybrid systems, both the receiver and transmitter of the magnetic **sensor** are mobile, thereby permitting them to be positioned flexibly and adaptively so as to minimize inaccuracies arising from the presence of peripheral metallic objects. The **3D** position and orientation of the transmitter are measured by an optical **sensor** in order to accurately track the transformation between the coordinate systems of the magnetic and optical sensors. The effects of the distance between the receiver and the transmitter and their respective distances from metallic objects on the accuracy of the system were evaluated by experiments both in the laboratory and in the operating room. (6 refs).

Descriptors

biomedical-measurement; biomedical-transducers; magneto-optical-sensors; navigation; optical-transmitters; receivers; spatial-variables-measurement; surgery.

Keywords

magnetooptic hybrid **3D sensor**; surgical navigation; accuracy; peripheral metallic objects; mobile receiver; mobile transmitter; magnetic **sensor**; flexible adaptive positioning; inaccuracy minimization; **3D** position measurement; **3D** orientation measurement; optical **sensor**; coordinate system transformation; receiver transmitter distance.

Classification codes

B7520 (Patient care and treatment).
B4160 (Magneto-optical devices).
B7230 (Sensing devices and transducers).
B7320C (Spatial variables measurement).

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